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(54) Filter cigarette machine

(57) Filter cigarettes with composite mouthpieces are produced by separately delivering different filter sections (B, W) to positions adjacent the ends of tobacco sections and wrapping and sealing them together to form a filter cigarette while they are moving in directions transverse to their lengths. The production process can be carried out on a modified plug assembler, thereby removing the need for any separate composite plug maker.

Fig.2.

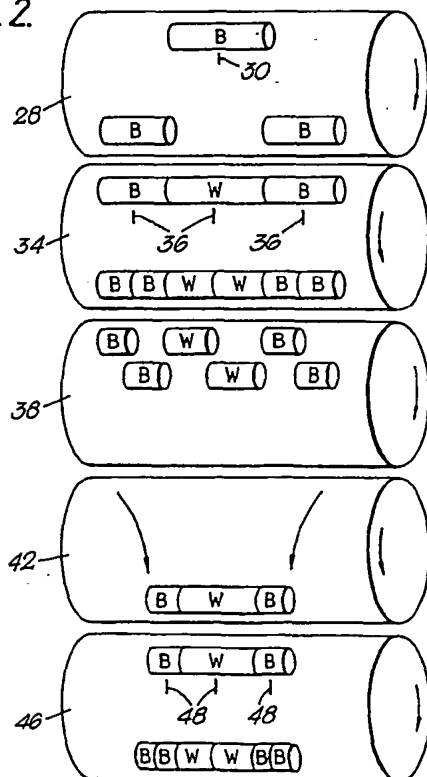
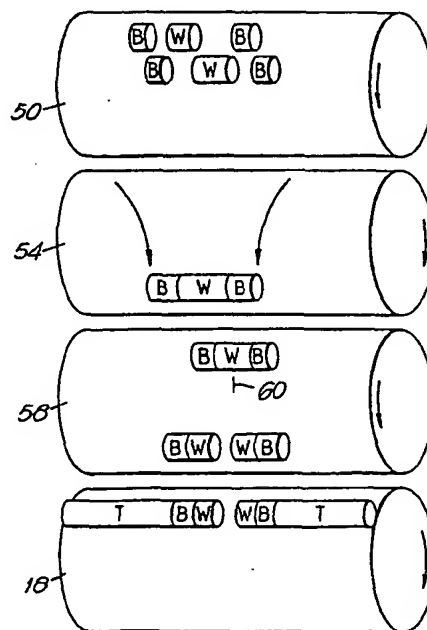


Fig.3.



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Fig.1.

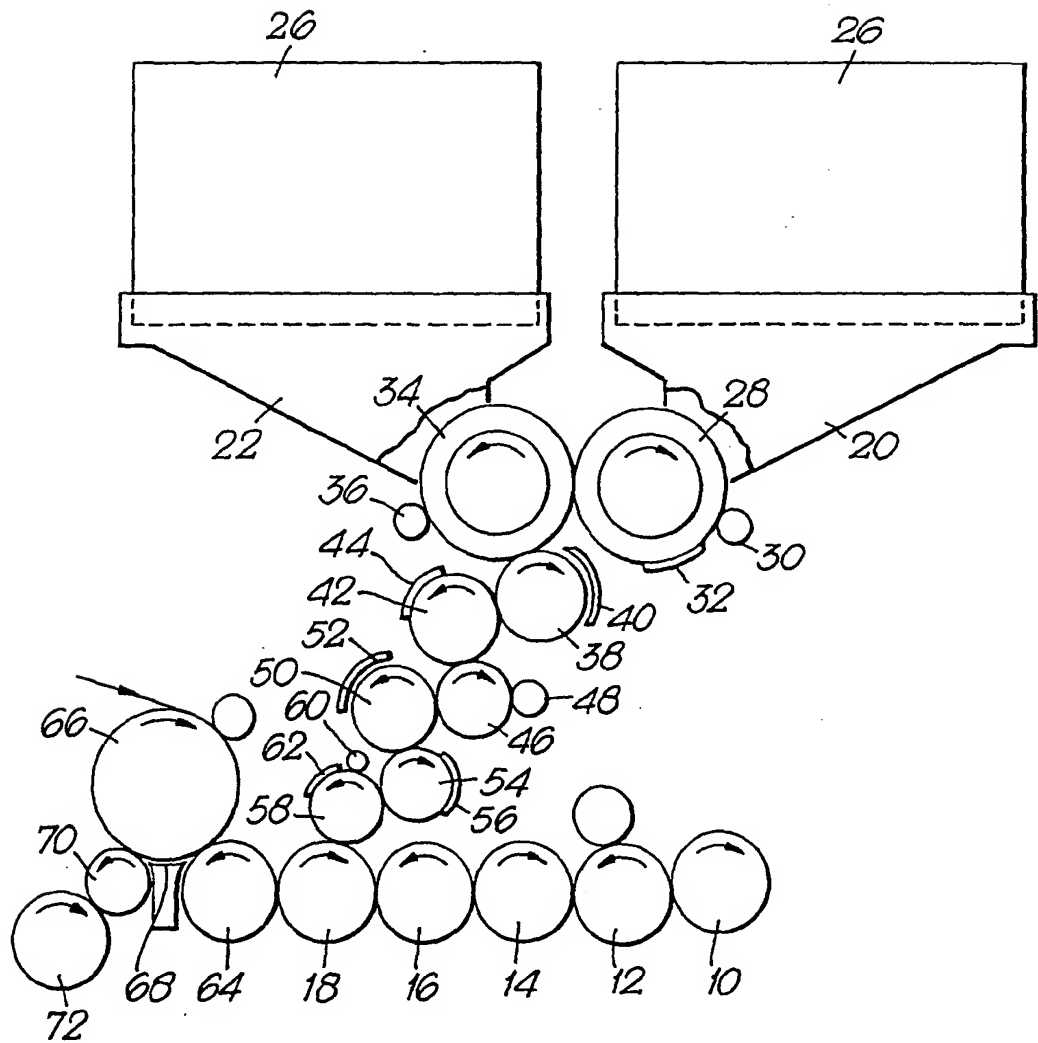


Fig. 2.

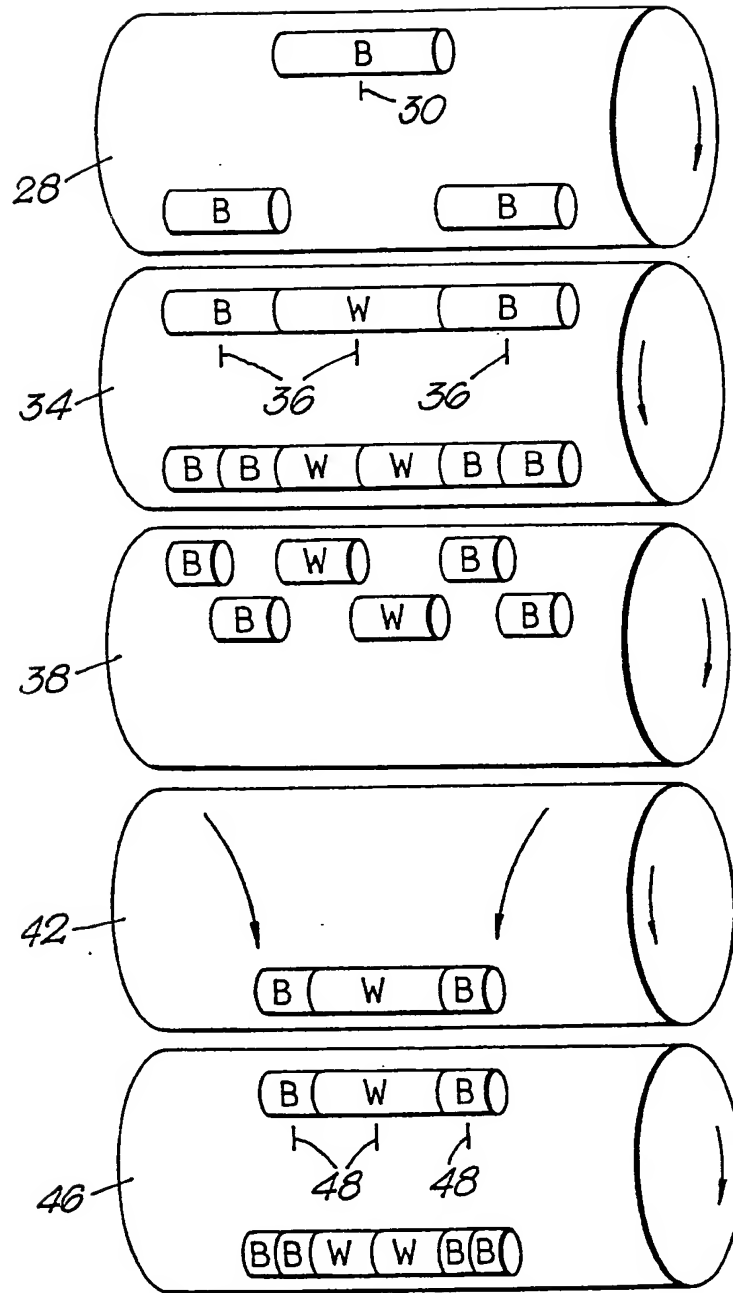
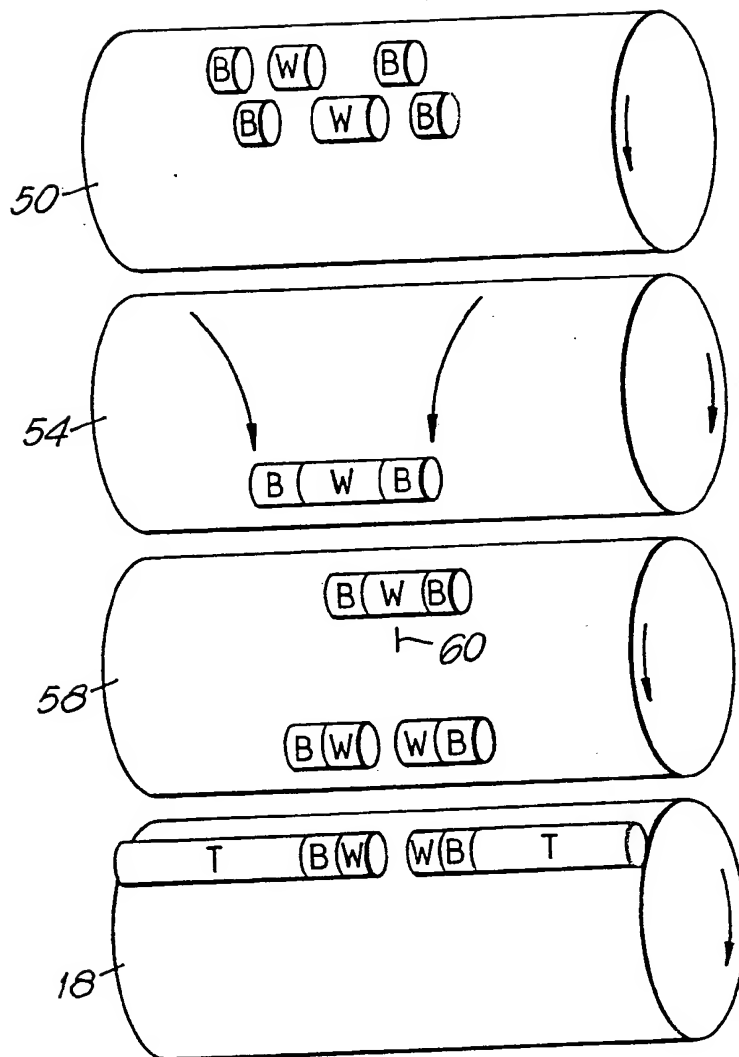


Fig. 3.



1 Filter Cigarette Manufacture

2
3 This invention relates to manufacture of filter cigarettes and in
4 particular to manufacture of such cigarettes having composite
5 mouthpieces.

6 As used herein the term "composite mouthpiece" includes any
7 mouthpiece having at least two different rod-like sections. For
8 convenience, reference hereinafter will be made to "filter sections" but it
9 should be understood that the sections need not have any
10 demonstrable filtering effect, e.g. they could be open tubes. Similarly,
11 each filter cigarette will be referred to as including a tobacco section
12 and filter portion. Thus the filter portions with which the present
13 invention is concerned comprise at least two filter sections. Unless the
14 context necessarily requires otherwise reference herein to a filter
15 cigarette, tobacco section, filter portion or filter section should be
16 interpreted as including a reference to such cigarette, section or portion
17 having a length which is either equal to or a multiple of that occurring in
18 an individual filter cigarette.

19 It is known to produce composite mouthpieces by assembling
20 component filter sections in a predetermined order in axial alignment
21 and wrapping and sealing the assembly in a uniting band. Usually the
22 assemblies so produced are of multiple length, e.g. four or six times the
23 length of an individual filter portion. In one known form of machine for
24 producing composite filter rod the component filter sections are
25 assembled on a series of drums while moving in a direction transverse
26 to their lengths prior to being wrapped and sealed while moving in an
27 axial direction. In another known form of machine the component filter
28 sections are assembled and wrapped and sealed while moving in an
29 axial direction. In both cases multiple length component filter rods are
30 subsequently transported to filter cigarette assembling machines for
31 joining to tobacco sections to form filter cigarettes.

32 According to the present invention a cigarette assembling
33 machine adapted to assemble filter cigarettes having composite
34 mouthpieces comprises means for delivering tobacco sections in a
35 direction transverse to their lengths, means for assembling first and
36 second filter sections in alignment with each tobacco section, and
37 means for wrapping and sealing said sections while they are moving
38 transverse to their lengths to produce a filter cigarette.

1 The machine preferably includes separate sources of multiple
2 length first and second filter sections and means for severing and
3 realigning said filter sections prior to bringing them into alignment with
4 the tobacco section. Preferably the machine includes at least one
5 conveyor on which an axially aligned assembly comprising axially-
6 spaced tobacco sections and interposed first and second filter sections
7 is conveyed in a direction transverse to its length. Preferably said
8 assembly comprises first filter sections immediately adjacent the inner
9 ends of the tobacco sections and a double length filter section (or two
10 single length filter sections) between the first filter sections.

11 The machine preferably includes a catcher drum or the like for
12 receiving the tobacco sections and may include a conventional cork
13 drum and rolling plate and conventional delivery system. Thus the
14 apparatus may comprise a conventional filter cigarette assembling
15 machine modified so as to assemble composite filter portions from
16 separate sources of the component filter sections.

17 As compared with conventional apparatus for producing filter
18 cigarettes having composite mouthpieces, in which a filter cigarette
19 assembling machine is fed with composite filter rod produced on a
20 separate composite rod making machine, the present apparatus has
21 several advantages. There is no requirement for such a separate
22 composite rod maker, nor for tray or other handling equipment for
23 transporting the composite mouthpiece rod to a filter cigarette
24 assembling machine. There are consequent potential savings in labour,
25 floor space (including storage space for composite mouthpiece rods),
26 and power consumption. Moreover there is a materials saving in that
27 the filter cigarette has only a single wrapper (the uniting band)
28 surrounding the filter sections: the need for a separate wrapper joining
29 the filter sections together is eliminated.

30 The invention will be further described, by way of example only,
31 with reference to the accompanying diagrammatic drawings, in which:

32 Figure 1 is a side elevation of a filter cigarette assembling
33 machine,

34 Figure 2 is a developed view of certain conveying drums of the
35 machine of Figure 1, showing the positions of filter sections on the
36 drums, and

37 Figure 3 is a view, similar to Figure 2, showing the positions of
38 filter sections on further conveying drums of the machine of Figure 1.

1 The machine shown in Figure 1 is arranged to produce a filter
2 cigarette having a tobacco section attached to a filter portion, the filter
3 portion comprising two adjacent sections of different filter materials.
4 The machine receives successive tobacco sections from a continuous
5 rod cigarette making machine on a catcher drum in a conventional
6 manner; and also joins the filter portion to each tobacco section in a
7 conventional manner, by rolling a uniting band around the filter portion
8 and adjacent end of the tobacco section. The manner in which this is
9 achieved is, for example, in the Molins PA10N filter cigarette assembling
10 machine. The machine shown in Figure 1 differs from conventional
11 machines in that each filter portion comprises two different filter sections
12 assembled on the machine.

13 In the machine of Figure 1 double length tobacco sections are
14 received from the making machine (not shown) on a fluted catcher drum
15 10 and are subsequently severed at their mid-points and axially
16 separated on a series of further drums 12-16. A series of axially
17 separated single length tobacco sections is thus transferred to a drum
18 18, downstream of the drum 16. The passage of the tobacco sections
19 between the drums 10 and 18 is substantially identical to that in said
20 Molins PA10N machine.

21 The drum 18 receives filter portions in axial alignment with each
22 tobacco section, as described below. Each filter portion comprises first
23 and second filter sections of different materials. Each filter section is
24 derived from a multiple length filter section delivered to the machine and
25 subsequently cut into individual sections. For convenience the different
26 filter sections will be hereinafter referred to as black sections and white
27 sections; the terms "black" and "white" have no reference to the colours
28 of the sections.

29 The machine has separate hoppers 20, 22 for the black and white
30 filter sections respectively. The sections received in each hopper 20, 22
31 are each eight times the length of an individual section contained in
32 each filter portion. Each of the hoppers 20, 22 is adapted to receive
33 filter sections from a respective tray 24, 26 placed above the hopper.

34 Referring also to Figure 2, the black sections B are removed from
35 the hopper 20 by a fluted drum 28. While being conveyed by the drum
36 28, they are cut at their mid-points by a knife 30 and then ploughed
37 axially apart by guides 32. The drum 28 transfers the axially-spaced
38 black sections B to a drum 34 which also serves to remove the white

1 sections W from the hopper 22, the white sections being received
2 between the axially spaced black sections. While being conveyed by
3 the drum 34, each black and white section is severed at its mid-point by
4 a knife 36 (i.e. there are three such knives). The resultant assembly of
5 six sections is transferred to a drum 38 having a rolling plate 40 which
6 causes the first, third and fifth sections to be rolled back as indicated in
7 Figure 2 so as to produce separate assemblages each having three
8 similar components (black, white, black). These assemblages are
9 transferred from the drum 38 to a drum 42 on which they are ploughed
10 together and into axial alignment by guides 44. The aligned sections
11 are transferred from the drum 42 to a drum 46 which cooperates with
12 knives 48 to sever each of the sections again at its mid-point.

13 Referring now also to Figure 3, the assemblages of six
14 component sections produced on the drum 46 are transferred to a drum
15 50 having a rolling plate 52 which causes the first, third and fifth
16 component sections to be rolled back, in a manner similar to that which
17 occurs on the drum 38, so as to produce two assemblages each of
18 three similar components. These assemblages are transferred from the
19 drum 50 to a drum 54 on which they are ploughed together and into
20 axial alignment by guides 56. From the drum 54 the assemblages are
21 transferred to a drum 58 on which the central white section W is severed
22 at its mid-point by a knife 60. This produces an assemblage of four
23 sections (black, white, white, black) each of individual length. A guide
24 62 causes the assemblage to be separated at its mid-point so as to
25 produce two pairs of sections each of which comprises the components
26 required for a filter portion (i.e. a black section and a white section). The
27 pairs of sections are transferred from the drum 58 to the drum 18 in
28 alignment with tobacco sections T, as shown in Figure 3.

29 From the drum 18 the tobacco and filter assemblies are
30 transferred via an alignment drum 64, to a cork drum 66 and rolling plate
31 68, at which a uniting band is wrapped and sealed around each tobacco
32 section and filter portion to produce individual filter cigarettes.

33 Downstream of the cork drum 68 the cigarettes are delivered by
34 way of drums 70,72 and further drums (not shown) which form no part
35 of this invention.

36 In an alternative arrangement the cutting and separating
37 operation provided on the drum 58 is omitted and a double length
38 cigarette is produced at the cork drum 66 and rolling plate 68 (using a

1 double width uniting band), the double length cigarette being
2 subsequently severed to yield individual length filter cigarettes on one of
3 the drums upstream of the final transfer drum 70.

4 Further details of apparatus for cutting and realigning filter
5 sections while conveying them in fluted drums, including rolling back
6 filter sections and subsequently shifting them axially, are contained in
7 British patent specification No. 1179683, to which reference is directed
8 for details.

9 Where there is a requirement to move sections axially or close
10 them up or align them the movement may be achieved by mechanical
11 displacement means or pneumatically or by a combination of both. One
12 advantageous way of shifting sections (or assemblages), which avoids
13 contacting their ends with mechanical means or exposing them to high
14 pressure air, is to use suction. Thus, a stop against which it is required
15 to move one end of a section (or assemblage) may have associated
16 suction means for drawing that end towards that stop.

1 Claims

2
3 1. A filter cigarette assembling machine adapted to assemble
4 filter cigarettes having composite mouthpieces, comprising means for
5 delivering tobacco sections in a direction transverse to their lengths,
6 means for assembling first and second filter sections in alignment with
7 each tobacco section, and means for wrapping and sealing said
8 sections while they are moving transverse to their lengths to produce a
9 filter cigarette.

10
11 2. A filter cigarette assembling machine, substantially as
12 herein described with particular reference to the accompanying
13 drawings.

-7-

Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

Application number

GB 9310158.2

Relevant Technical fields

(i) UK CI (Edition L) A2C CGMB CGJA

(ii) Int CI (Edition 5) A24D 3/02

Databases (see over)

(i) UK Patent Office

(ii)

Search Examiner

M ELLIOTT

Date of Search

5 AUGUST 1993

Documents considered relevant following a search in respect of claims 1-2

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 1179683 (LONDON MOLINS MACHINE CO)	1

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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&c: Member of the same patent family, corresponding document.

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